

- a) a sheet of diffusion-controlling matrix selected from the group consisting of secondary valence gels, synthetic polymer gels and viscous solutions;
 - b) at least one biological sensor contained in said sheet of diffusion-controlling matrix and capable of producing at least one signal in response to the presence of a substance which is in contact with at least one spatially-discrete area of said sheet of diffusion-controlling matrix, and
 - c) means for detecting the spatial distribution of signal(s) produced when said substance is in contact with at least one spatially-discrete area of said sheet of diffusion-controlling matrix.
28. (New) The system of claim 27 further comprising a support for the substance to be detected, said support being in contact with said sheet of diffusion-controlling matrix such that a substance to be detected which is located on said support is in contact with at least one spatially-discrete area of said diffusion-controlling matrix.
29. (New) The system of claim 27 wherein said secondary valence gel is agarose.
30. (New) The system of claim 27 wherein said synthetic polymer gel is a polyacrylate.
31. (New) The system of claim 27 wherein said biological sensor is selected from the group consisting of subcellular particles, enzymes, antibodies, fluorescent materials, indicator dyes, and prokaryotic or eukaryotic cells with reporter gene constructs.
32. (New) The system of claim 27 wherein more than one biological sensor is employed.
33. (New) The system of claim 27 wherein one biological sensor which is capable of producing a plurality of different signals simultaneously is employed.

34. (New) The system of claim 27 wherein said diffusion-controlling matrix further comprises at least one additive which influences the detection sensitivity, the selectivity, or the kinetics of the diffusion-controlling matrix.
35. (New) The system of claim 34 wherein said additive is a buffer for regulating the vitality of biological sensor cells.
36. (New) The system of claim 27 wherein said diffusion-controlling matrix further comprises a bioluminescent substrate, a chemiluminescent reagent or a fluorescent reagent.
37. (New) The system of claim 27 comprising a plurality of sheets of diffusion-controlling matrices containing different constituents.
38. (New) The system of claim 27 wherein said diffusion-controlling matrix contains about 2 to about 8 ml of reporter gene suspension per 50 ml of matrix composition.
39. (New) The system of claim 27 wherein said diffusion-controlling matrix contains about 3 to about 5 ml of reporter gene suspension per 50 ml of matrix composition.
40. (New) The system of claim 27 wherein said biological sensor is cells containing at least one reporter gene, and said sheet of diffusion-controlling matrix containing said biological sensor has an optical density of about 0.6 to about 1.4 at 660 nm.
41. (New) The system of claim 27 wherein said sheet of diffusion-controlling matrix has a thickness of about 0.1 to about 10.0 mm.
42. (New) The system of claim 41 wherein said sheet of diffusion-controlling matrix has a thickness of about 0.5 to about 3 mm.